

OPERATING INSTRUCTIONS

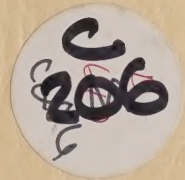
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OTL



TYPE 1266-A

ADJUSTABLE AC
POWER SOURCE



GENERAL RADIO COMPANY

OPERATING INSTRUCTIONS

TYPE 1266-A

ADJUSTABLE AC POWER SOURCE

Form 1266-0100-A
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West Concord, Massachusetts, USA

G E N E R A L R A D I O C O M P A N Y
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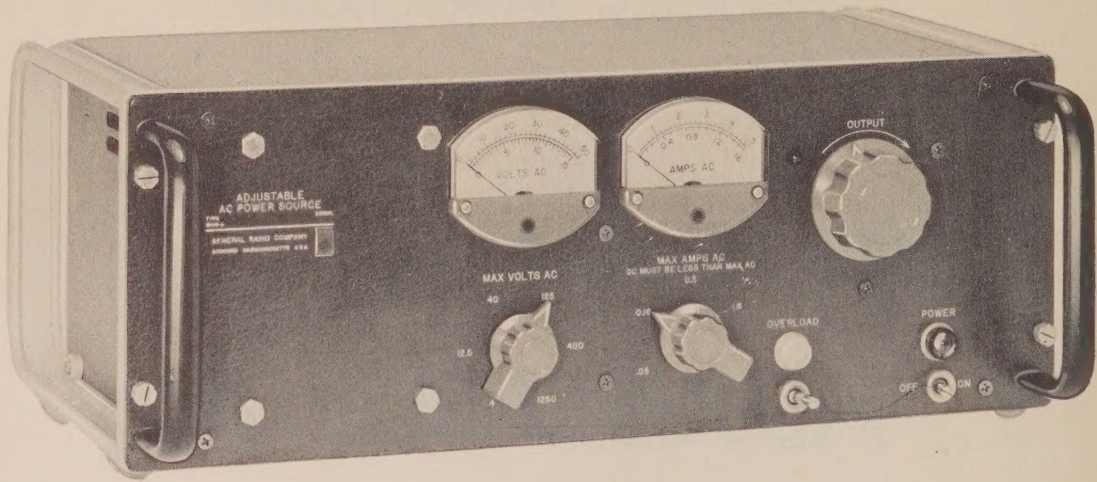


Figure 1-1. Panel view of the Type 1266-A Adjustable AC Power Source.

SPECIFICATIONS

Output: 200 volt-amperes.

Voltage Ranges: 0-4, 0-12.5, 0-40, 0-125, 0-400, 0-1250. (Refer to Table 2 for 50-cycle operation.)

Current Ranges: 0-0.05, 0-0.16, 0-0.5, 0-1.6, 0-5.0 ac amperes.

DC Tolerance: Refer to Table 1.

Power Input: 105 to 125 (or 210 to 250) volts, 50 to 60 cps; approximately 230 volt-amperes. (Refer to Table 2 for 50-cycle operation).

Accessories Supplied: One Type CAP-22, 3-wire Power Cord and spare fuses.

Mounting: Relay-rack panel with cabinet; Type 1266-AR includes fittings to permit either the instrument or the cabinet to be removed from the rack without disturbing the other; Type 1266-AM has end supports for table or bench use.

Dimensions: Bench model, width 19, height $7\frac{1}{2}$, depth $17\frac{1}{4}$ inches (485 by 190 by 440 mm), overall. Rack model, panel 19 by 7 inches (485 by 180 mm), depth behind panel 15 inches (385 mm).

Net Weight: 46 pounds (21 kg).

U.S. Patent No. 2,949,592

SECTION 1

INTRODUCTION

1.1 PURPOSE.

The Type 1266-A Adjustable AC Power Source (Figure 1-1) provides a multi-range source of voltage and current at power line frequencies between 50 and 60 cps. Although designed especially for use with the General Radio Type 1633-A Incremental Inductance Bridge, it can be used wherever an adjustable, high-power (200 volt-amperes) source is required.

1.2 DESCRIPTION.

1.2.1 GENERAL. The instrument provides up to 1250 rms volts ac in six ranges, at values of current up to six amperes, with a maximum power rating of 200 volt-amperes. The circuit includes a Variac® autotransformer and a tapped output transformer. The output is adjusted over each range by means of the panel OUTPUT control and is monitored by separ-

ate voltage and current meters on the front panel. The maximum allowable voltage and current ranges are selected by two separate panel controls. A switching interlock and a circuit breaker are included to prevent any harmful overload. An OVERLOAD lamp on the front panel warns the operator when the current rating is exceeded.

The instrument is designed to carry a direct current equal to, but not exceeding, the maximum allowable alternating current selected by the MAX AMPS AC switch. It can safely handle the large values of direct current provided by the Type 1265-A Adjustable DC Power Supply. In the Type 1630-AL Inductance Measuring Assembly, the two power sources are connected in series to form the generator for the Type 1633-A Incremental Inductance Bridge. (Refer to the separate Operating Instructions for the above-mentioned instruments.)

1.2.2 TABLE OF CONTROLS AND CONNECTORS.

Name	Schematic Diagram Reference (Fig. 3-3)	Type	Function
MAX VOLTS AC	S101	6-position rotary switch	Selects the maximum available voltage (6 ranges).
MAX AMPS AC	S102	5-position rotary switch	Selects the full scale current range for its associated ammeter (5 ranges).
OUTPUT	R105	Continuous rotary control	Clockwise rotation increases the output voltage from zero to the maximum value selected by the MAX VOLTS AC switch. The value of the output voltage is indicated by the panel voltmeter.
POWER OFF-ON	S103	2-position toggle switch and pilot light	Connects and disconnects line input. Disconnects both sides of the line when in the OFF position. Associated pilot light is illuminated when power is on.

(Continued)



1.2.2 TABLE OF CONTROLS AND CONNECTORS (Cont).

Name	Schematic Diagram Reference (Fig. 3-3)	Type	Function
OVERLOAD	S104	Momentary-contact toggle switch and pilot light	Restores operation after an overload trip-out. Circuit is restored when switch is thrown momentarily. Overload condition is indicated by lighting of associated pilot light.
None	PL101	3-wire power socket (on rear panel)	For connection to either 120- or 240- volt power mains, frequency between 60 and 400 cps.
None	J101, 102, 103	Jack-top binding posts (three, on rear panel)	For connection to any appropriate load.
None	SO101	4-wire receptacle (on rear panel)	For connection to Type 1633-A Incremental Inductance Bridge (as in the Type 1630-AL Inductance Measuring Assembly).

1.2.3 MOUNTING. The instrument is available as either the Type 1266-AM, for bench mounting, or Type 1266-AR, for relay-rack mounting. The bench model is equipped with aluminum end frames (Type ZFRI-408-3), while the Type 1266-AR includes mounting brackets (Type ZSU-6-4). These brackets permit either cabinet or instrument to be withdrawn

independently of the other. Instructions for installing the Type 1266-AR in a relay rack accompany these brackets.

1.2.4 ACCESSORIES SUPPLIED. One Type CAP-22 three-wire Power Cord and spare fuses are supplied with the instrument.

SECTION 2

OPERATING PROCEDURE

WARNING

When the Inductance Bridge is used with an inductive load, the outputs from all generators, both ac and dc, must be turned off before a change is made in any switch position or in the load connections. If this precaution is disregarded, considerable damage to the equipment and/or very serious injury or death to the operator can result, due to the large amount of stored energy in inductors measurable on the Type 1633-A Incremental Inductance Bridge.

2.1 POWER CONNECTIONS.

2.1.1 120-VOLT OPERATION. Terminals 1 and 2 should be connected to terminals 3 and 4, respectively, on power transformer T102 (see Figure 3-1), and there should be a connection between tie points A.T. 113 and A.T. 114, located on the printed circuit board behind current transformer T103. The rating of each of the three fuses should be 3.2 amperes. The voltage label on the rear panel, above the power input socket, should read "105-125 v, 50-60 c." With the POWER switch turned off, connect the Type CAP-22 Power Cord from the power mains to the power input socket.

2.1.2 240-VOLT OPERATION. Remove the connections between terminals 1 and 3 and terminals 2 and 4 on power transformer T102, (see Figure 3-1); connect terminals 2 and 3. Connect tie points A.T. 114 and A.T. 115 on the printed circuit board behind current transformer T103. The rating of each of the pair of fuses (side by side, on the rear panel) should be 1.6 amperes. The rating of the single fuse should be 3.2 amperes. The voltage label on the rear panel, above the power input socket, should read "210-250 v, 50-60 c." With the POWER switch turned off, connect the Type CAP-22 Power Cord from the power mains to the power input socket.

2.2 LOAD CONNECTIONS.

The output from the Type 1266-A Power Source is available at the red (high) and the black (low) binding posts on the rear panel. The 4-wire, polarized plug on the Type 1633-A Incremental Inductance Bridge completes the load circuit. The metal binding post on the rear panel of the Type 1266-A Power Source connects directly to the chassis. It can be

used as a grounding point for the chassis or for the low side of the load.

2.3 LOAD VOLTAGE AND CURRENT ADJUSTMENTS.

With all power turned off (both ac and dc), select the desired ranges on the MAX VOLTS AC and the MAX AMPS AC switches. These switches are designed with two positions between successive ranges, to reduce the possibility of arcing if the system is inadvertently switched under load. The voltage and current switches are mechanically interlocked to prevent the product of the two range settings from exceeding 200 volt-amperes at any time.

Turn the OUTPUT control fully counterclockwise. Make any necessary adjustments of the Type 1265-A DC Power Supply. Then turn on the POWER switch of the Type 1266-A Source. The pilot lamp should light. If the OVERLOAD lamp also lights, operate its associated toggle switch to extinguish it and to restore the circuit. Rotate the OUTPUT control to secure the desired voltage (indicated by the meter above the MAX VOLTS AC switch) or current (indicated by the meter above the MAX AMPS AC switch). If the maximum allowable current is substantially exceeded, the overload circuit will operate (indicated by the OVERLOAD lamp). When this occurs, turn the OUTPUT control fully counterclockwise, reset the OVERLOAD switch, and repeat the above procedure. Always turn off the power switches on both the ac and dc sources before the load connections or the switch settings are changed.

2.4 DIRECT-CURRENT LIMITS.

As a rule, the direct current for any particular voltage range should not exceed the maximum allowable alternating current for that range. However,



TABLE 1

		MAX VOLTS AC Switch Setting					
		4	12.5	40	125	400	1250
MAX AMPS AC Switch Setting	5	10	10	5			
	1.6	10	10	5	1.6		
	0.5	5	5	5	1.6	0.5	
	0.16	1.6	1.6	1.6	1.6	0.5	0.16
	0.05	0.5	0.5	0.5	0.5	0.5	0.16
		DC Amperes					

Maximum allowable dc amperes for each setting of the panel switches.

when the MAX AMPS AC switch is set to a current range lower than the allowable current for the selected voltage range, certain liberties can be taken with this rule. Table 1 gives the maximum allowable dc amperes for each combination of settings of the two range switches.

2.5 LOAD VOLTAGE.

The panel voltmeter indicates the open-circuit load voltage. The actual load voltage is this value less the voltage drops in (1) the Type 1266-A AC Source, (2) the Type 1265-A DC Supply, and (3) the bridge circuit. If the load voltage must be known more accurately, use a high-impedance, vacuum-tube voltmeter connected directly across the load.

2.6 RESIDUAL METER READING.

At certain positions of the OUTPUT control, the MAX AMPS AC meter will read slightly upscale due to the stray field from the OUTPUT control Variac® Autotransformer, even with no load. Since the useful meter scale is the upper two-thirds, this slight deflection may be ignored in practice.

2.7 OPERATION ON A 50-CYCLE LINE.

The Type 1266-A Adjustable AC Power Source can be operated from a 50-cycle line, but the maximum value of available ac volts is limited to 5/6 of the value indicated by the MAX VOLTS AC switch setting. The OUTPUT control should be set to give a reading of the panel voltmeter that does not exceed the value given in Table 2.

TABLE 2

MAX VOLTS AC Switch Setting	4	12.5	40	125	400	1250
Max Available AC Volts with 50-cycle Line	3.33	10.4	33.3	104	333	1040

Maximum available ac volts, as read on the panel voltmeter, for 50-cycle operation.

SECTION 3

SERVICE AND MAINTENANCE

3.1 WARRANTY.

We warrant that each new instrument sold by us is free from defects in material and workmanship and that, properly used, it will perform in full accordance with applicable specifications for a period of two years after original shipment. Any instrument or component that is found within the two-year period not to meet these standards after examination by our factory, district office, or authorized repair agency personnel will be repaired or, at our option, replaced without charge, except for tubes or batteries that have given normal service.

3.2 SERVICE.

The two-year warranty stated above attests the quality of materials and workmanship in our products. When difficulties do occur, our service engineers will

assist in any way possible. If the difficulty cannot be eliminated by use of the following service instructions, please write or phone our Service Department (see rear cover), giving full information of the trouble and of steps taken to remedy it. Be sure to mention the serial and type numbers of the instrument.

Before returning an instrument to General Radio for service, please write to our Service Department or nearest district office (see rear cover), requesting a Returned Material Tag. Use of this tag will ensure proper handling and identification. For instruments not covered by the warranty, a purchase order should be forwarded to avoid unnecessary delay.

Because the Type 1266-A Adjustable AC Power Source is capable of delivering lethal energy, only well-qualified personnel should attempt to repair or adjust the instrument. In most cases it should be returned to General Radio if servicing is required.

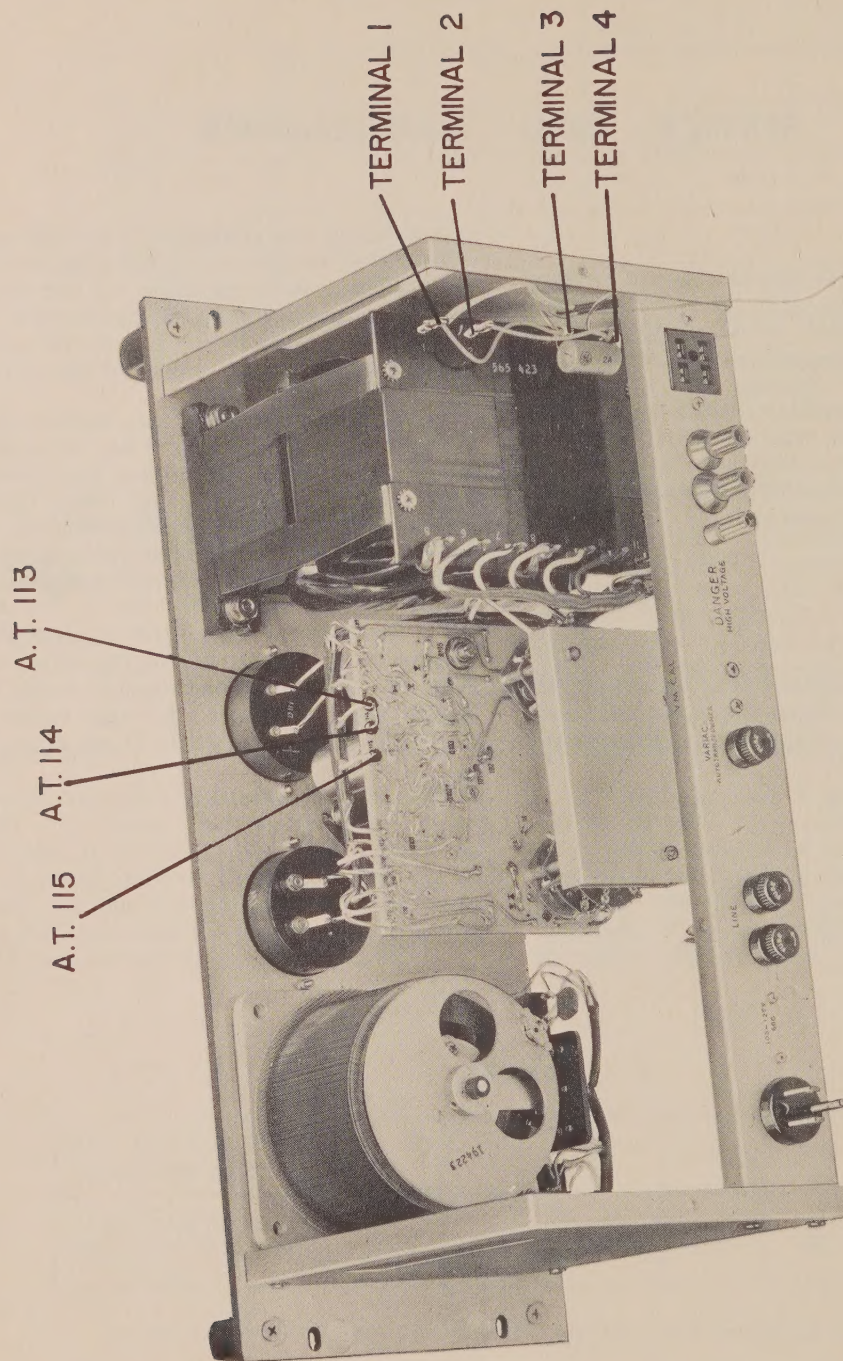


Figure 3-1. Rear interior view of the Type 1266-A Adjustable AC Power Source.

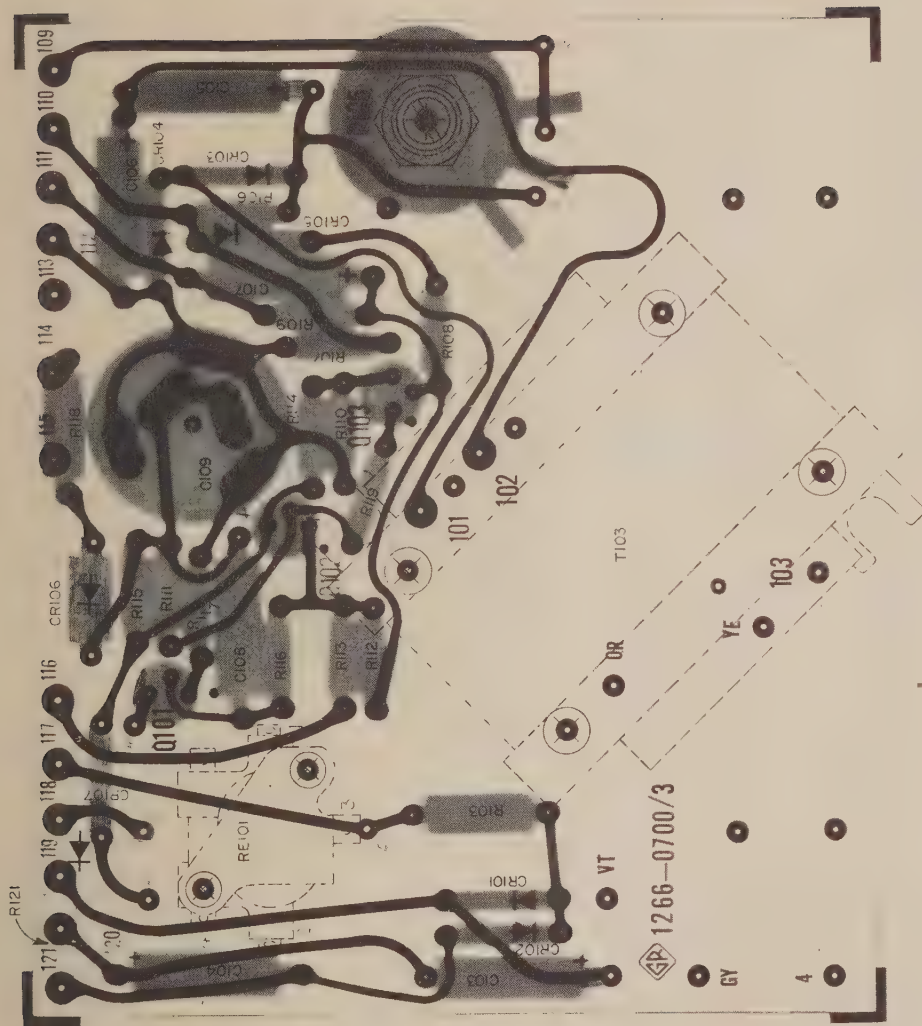


Figure 3-2. Etched board layout for Type 1266-A Adjustable AC Power Source.

PARTS LIST

RESISTORS

R101	200 k	±5%	1/2 w	REC-20BF(204B)
R103	309 k	±1%	1/4 w	REF-65(3093A)
R105	1 k	±10%		POSW-3(102C)
R106	1 k	±5%	1/2 w	REC-20BF(102B)
R107	2 k	±5%	1/2 w	REC-20BF(202B)
R108	4.7 k	±5%	1/2 w	REC-20BF(472B)
R109	47 k	±5%	1/2 w	REC-20BF(473B)
R110	100	±5%	1/2 w	REC-20BF(101B)
R111	2 k	±5%	1/2 w	REC-20BF(202B)
R112	30 k	±5%	1/2 w	REC-20BF(303B)
R113	240	±5%	1/2 w	REC-20BF(241B)
R114	3 k	±5%	1/2 w	REC-20BF(302B)
R115	10	±5%	1/2 w	REC-20BF(100B)
R116	1 k	±5%	1/2 w	REC-20BF(102B)
R117	100	±5%	1/2 w	REC-20BF(101B)
R118	1	±5%	2 w	REW-3C(010C)
R119	3 k	±5%	1/2 w	REC-20BF(302B)
R120	250 Ω	±10%		POSW-3(251C)
R121	2.4 k	± 5%	1/2 w	REC-20BF(242B)
R122				REU-1001

CAPACITORS

C101	.0033 μf	±20%	500 dcwv	COC-62(332D)
C102	.0033 μf	±20%	500 dcwv	COC-62(332D)
C103	50 μf	+100-10%	3 dcwv	COE-63
C104	50 μf	+100-10%	3 dcwv	COE-63
C105	50 μf	+100-10%	3 dcwv	COE-63
C106	50 μf	+100-10%	3 dcwv	COE-63
C107	5 μf	+100-10%	50 dcwv	COE-57
C108	10 μf	+100-10%	25 dcwv	COE-56
C109A	200	+100-10%	25 dcwv	COE-64
C109B	200			
C110	0.1 μf	+80-20%	50 dcwv	COC-63-3

DIODES

CR101	2RED-1008/1N191	CR105	2RED-1008/1N191
CR102	2RED-1008/1N191	CR106	2RE-1001/1N3253
CR103	2RED-1008/1N191	CR107	2RED-1016/1N645
CR104	2RED-1008/1N191		

TRANSISTORS

Q101	TR-10/2N1374
Q102	TR-10/2N1374
Q103	TR-29/2N708

FUSES

115 v:

F101	3.2 amp	FUF-1
F102	3.2 amp	FUF-1
F103	3.2 amp	FUF-1

230 v:

F101	1.6 amp	FUF-1
F101	1.6 amp	FUF-1
F103	3.2 amp	FUF-1

SWITCHES

S101	SWRW-2750
S102	SWRW-2740
S103	SWT-333
S104	SWT-9

TRANSFORMERS

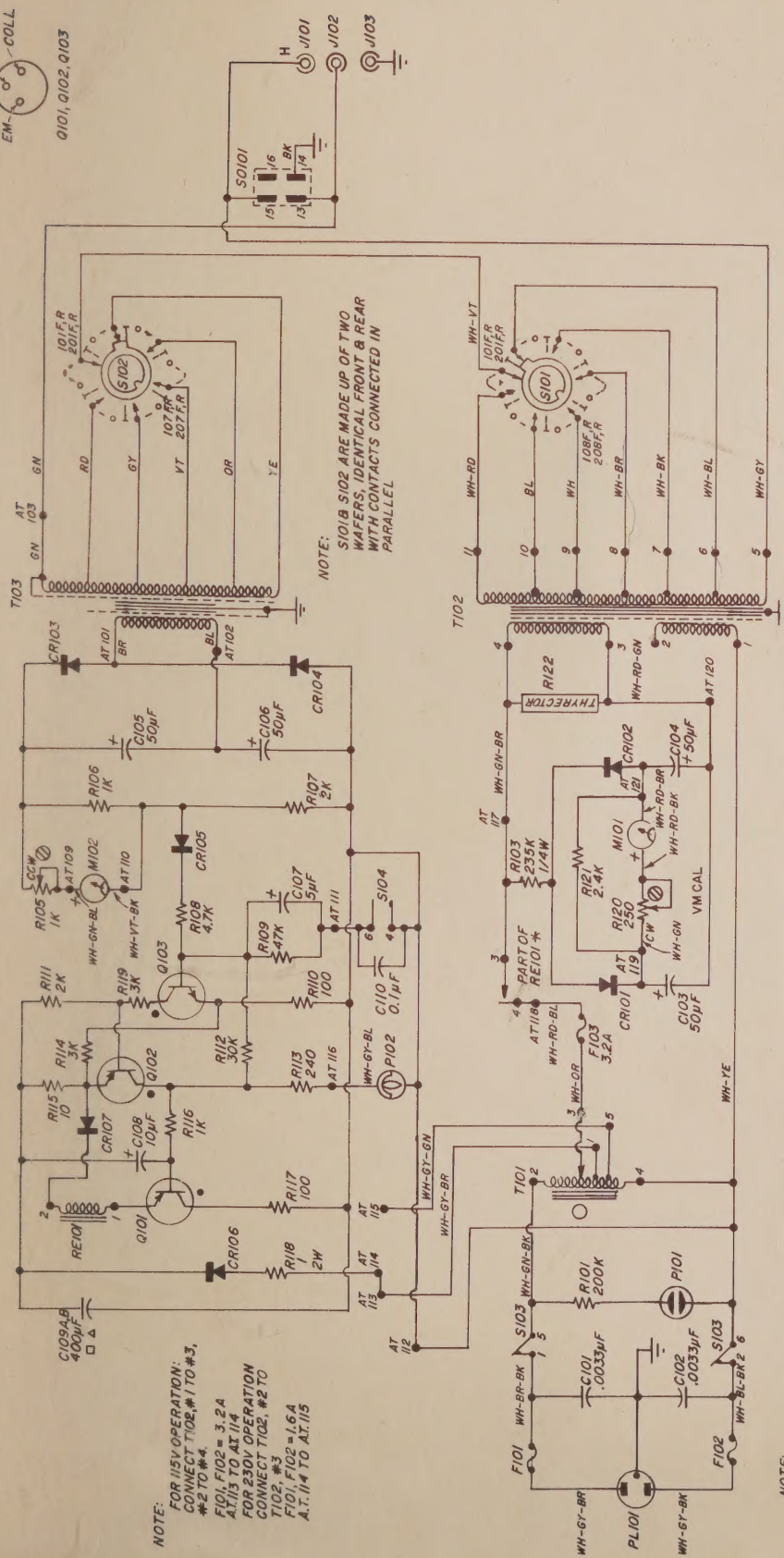
T101	W5-4070
T102	0565-4230
T103	0485-4007

MISCELLANEOUS

J101	JACK	BP-5R
J102	JACK	BP-5R
J103	JACK	BP-10, 1/2
M101	METER	MEDS-1361
M102	METER	MEDS-1362
P101	PILOT LAMP	NE-51
P102	PILOT LAMP	2LAP-939A
RE101	RELAY	2RE-7
SO101	SOCKET	CDMS-11-4
PL101	PLUG	CDPP-10

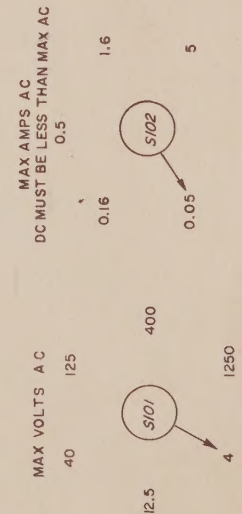
EM-BASE
COLL

Q101, Q102, Q103



EXPLANATION OF CONTACT NUMBERING ON ROTARY SWITCHES.

Rotary switch sections are shown as viewed from the panel end of the shaft. The first digit of the contact number refers to the section. The section nearest the panel is 1, the next section back is 2, etc. The next two digits refer to the contact. Contact 01 is the first position clockwise from a strut screw (usually the screw above the locating key), and the other contacts are numbered sequentially (02, 03, 04, etc), proceeding clockwise around the section. A suffix F or R indicates that the contact is on the front or rear of the section, respectively.



NOTE: RESISTORS 1/2 WATT UNLESS SPECIFIED
RESISTANCE IN OHMS UNLESS SPECIFIED
K = 1000 OHMS M = 1M OHMS
② SCREWDRIVER CONTROL
○ KNOB CONTROL
* NORMALLY OPEN WHEN NOT ENERGIZED

ANCHOR TERMINALS USED: 101 THRU 103, 109 THRU 121

Figure 3-3. Schematic diagram for Type 1266-A Adjustable AC Power Source.

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Mission 6-7400

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